

Claims

[c1] 1. A mount assembly for coupling a vehicle powertrain assembly and a vehicle chassis, the mount assembly comprising:
at least one switchable mount operable in at least an engine idle mode;
at least one vehicle sensor operatively connected to the powertrain; and
a controller for receiving and processing input from the at least one vehicle sensor, and
for commanding the switchable mount to be in the engine idle mode when the processed input of at least one vehicle sensor exceeds a pre-selected threshold.

[c2] 2. The mount assembly of claim 1, wherein the switchable mount is adapted to be attached to an engine of the vehicle powertrain assembly.

[c3] 3. The mount assembly of claim 1, wherein the controller controls the actuation of a three-way vacuum solenoid valve (VSV) communicatively attached to the controller and wherein the mount assembly further comprises,
a first vacuum line for connecting the VSV to the switchable mount, and
a second vacuum line for connecting the VSV to an engine intake manifold.

[c4] 4. The mount assembly of claim 1, wherein the controller controls the actuation of a mechanical switch.

[c5] 5. The mount assembly of claim 1, wherein the controller controls the actuation of an electrical switch.

[c6] 6. The mount assembly of claim 1 wherein the at least one vehicle sensor is adapted to measure one or more of engine speed, accelerator position, key ON/OFF position, and gear selector position.

[c7] 7. The mount assembly of claim 1 wherein the pre-selected threshold comprises a measured increase in engine torque rate.

[c8] 8. The mount assembly of claim 1 wherein the pre-selected threshold comprises a minimum measured increase in engine speed rate.

[c9] 9. The mount assembly of claim 8, wherein the increase in engine speed rate is

at least 4000 RPM/sec.

- [c10] 10.The mount assembly of claim 1 wherein the controller comprises a delay timer for delaying the issuance of a command signal for a pre-selected time interval.
- [c11] 11.The mount assembly of claim 10, wherein the time interval is between 500 and 1000 milliseconds.
- [c12] 12.The mount assembly of claim 6, wherein the at least one vehicle sensor measures a powertrain crankshaft speed.
- [c13] 13.The mount assembly of claim 6, wherein the at least one vehicle sensor measures a powertrain camshaft speed.
- [c14] 14.A vehicle, comprising:
 - a powertrain having an engine and a vehicle chassis and being provided with a mount assembly for coupling the vehicle powertrain assembly and said vehicle chassis; and
 - the mount assembly comprising, at least one switchable mount operable in at least an engine idle mode, at least one vehicle sensor operatively connected to the powertrain, and a controller for receiving and processing input from the at least one vehicle sensor, and
 - for commanding the switchable mount to be in the engine idle mode when the processed input of at least one vehicle sensor exceeds a pre-selected threshold.
- [c15] 15.The vehicle of claim 14, wherein said vehicle is a hybrid electric vehicle.
- [c16] 16.A method for controlling a switchable mount assembly that couples a vehicle powertrain assembly and a vehicle chassis comprising the steps of:
 - receiving and processing input of at least one vehicle sensor output; and
 - commanding the switchable mount to switch from a default drive mode to an engine idle mode when the processed input of at least one vehicle sensor exceeds a pre-selected threshold.
- [c17] 17.The method of claim 16, wherein the step of receiving input of at least one vehicle sensor comprises at least one of the steps of:

receiving an output of an engine speed sensor;
receiving an output of an accelerator position sensor;
receiving an output of an key ON/OFF sensor; and
receiving an output of a gear selector position sensor.

[c18] 18.The method of claim 16, wherein the step of commanding the switchable mount to switch from said default drive mode to said engine idle mode comprises the steps of:
determining whether a pre-selected threshold increase in engine torque rate is exceeded;
determining whether a pre-selected threshold increase in engine speed rate is exceeded; and
determining whether a pre-selected time interval has been exceeded.

[c19] 19.A system for controlling a switchable mount assembly adapted for coupling a vehicle powertrain assembly and a vehicle chassis, comprising:
at least one sensor provided within the powertrain assembly for issuing an output signal;
a controller operatively connected to the at least one sensor;
a program of control logic embodied within the controller to interpret said signal and to issue a command signal based on said interpretation to control the switchable mount to alternate between at least two operational modes thereby providing at least two alternate vibration damping support characteristics between said powertrain and said vehicle chassis.

[c20] 20.The system of claim 19, wherein the control logic is adapted to determine if said engine is in an idle mode and likely to remain in said idle mode.